

ABSTRACT

DISSERTATION/THESIS/RESEARCH PAPER/CREATIVE PROJECT: Electronic Properties of Graphene Nano Structures

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DATE: December 2016

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The general objective of the research project is to study the electronic properties of graphene nanoribbons (GNRs). These ribbons can be viewed as strips of graphene with infinite lengths and finite widths. These nanoribbons can be either metallic or semiconducting depending on their edge structures and widths. Based on the edge structure, GNRs are known as zigzag and armchair. Energy band structure, density of states, and conductance are calculated using a tight-binding (TB) model, Green's function method, Landauer formula, and the Extended Hückel theory (EHT). Our interest is to compare the EHT results with the Hückel theory results where only Pz orbitals are included in the calculation. The EHT technique not only includes the Pz orbital interactions but also the other valence orbitals.